THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

AMERICAN RAILCAR INDUSTRIES, INC. Petitioner, v. FEDERAL RAILROAD ADMINISTRATION, et. al. Respondents.	)	Case No. 16-1420

UNDERLYING DECISION FROM WHICH APPEAL ARISES

Attached hereto as Exhibit A is Railworthiness Directive No. 2016-01 (Original and Revised) (the "Railworthiness Directive"), issued by the U.S. Department of Transportation's Federal Railroad Administration. The Railworthiness Directive was initially issued on September 30, 2016, and a revised version was issued on November 18, 2016. Because the revised Railworthiness Directive incorporates and refers to the original version, both are being challenged and both are attached hereto.

Respectfully submitted,

K&L GATES LLP

January 3, 2017

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CERTIFICATE OF SERVICE

I hereby certify that on the 3rd day of January, 2017, a copy of the foregoing document was filed and served by electronic mail pursuant to the parties' consent, upon the following persons:

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Exhibit A

UNITED STATES DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RAILWORTHINESS DIRECTIVE (RWD)
RWD No. 2016-01

This document is an FRA Railworthiness Directive (Directive) issued under 49 C.F.R. § 180.509(b)(4). FRA is issuing this Directive to all owners of Department of Transportation (DOT) specification 111 general purpose tank cars. FRA is issuing this directive based on its finding that as a result of non-conforming welding practices, DOT-111 tank cars built by American Railcar Industries, Inc. (ARI) and ACF Industries, LLC (ACF) between 2009 and 2015 to the ARI and ACF 300 stub sill design and equipped with a two piece cast sump and bottom outlet valve (BOV) skid may be in an unsafe operating condition and could result in the release of hazardous materials. As a result of non-conforming welding practices, these cars may have substantial weld defects at the sump and BOV skid groove attachment welds, potentially affecting each tank's ability to retain its contents during transportation. Further, the use of tank cars with the defective welds identified violates the requirements of the Federal Hazardous Materials regulations (HMR; 49 CFR parts 171-180).[1] FRA is issuing this Directive to ensure public safety, ensure compliance with the applicable Federal regulations governing the safe movement of hazardous materials by rail, and ensure the railworthiness[2] of the tank cars. This Directive requires owners to: (1) identify tank cars in their fleet covered by this Directive; and (2) ensure appropriate inspection and testing of each tank car's sump and BOV skid groove attachment welds to ensure no flaw exists which could result in the loss of tank integrity.

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[1] See 49 CFR § 179.200-10.
[2] 49 CFR § 180.503.

I. BACKGROUND

On May 9, 2014, Canadian Pacific Railway (CP) notified FRA of tank car CTCX 736177, leaking denatured alcohol (ethanol) in CP's Bensenville Yard in Franklin Park, Illinois. Tank car CTCX 736177 is a 30,000 gallon specification DOT 111A100W-1 non-coiled, non-insulated, general purpose tank car manufactured for the transportation of Class 3 flammable liquids and owned by The CIT Group/Equipment Financing Inc. (CIT). ARI manufactured the tank car in its Marmaduke, Arkansas facility in May 2012, to the company's ARI 300 stub sill design.[3] CP contacted an environmental response company, SUNPRO, Inc., who applied an epoxy patch to stop the leak. On May 10, 2014, FRA personnel inspected the car and found the patched area between the cast sump and BOV skid halves on the bottom of the tank. At CIT's direction, on May 29, 2014, SUNPRO transferred tank car CTCX 736177's lading into another tank car and CP moved tank car CTCX 736177 to the Greenbrier Rail Services' (Greenbrier) Atchison, Kansas, repair facility for further inspection. Greenbrier inspected the sump and BOV skid groove attachment weld joints using liquid penetrant, ultrasonic, and visual inspection nondestructive testing (NDT) methods. During the inspection at Greenbrier's facility, representatives of CIT, ARI, FRA, and Greenbrier identified defects in the groove attachment welds at the sump and BOV skid, including small pinholes (porosity), incomplete joint fusion, incomplete joint penetration, and cracks.

Design drawings require the groove attachment welds joining the tank shell plate, the cast sump, and the cast BOV skid, to be full penetration and full fusion (i.e., the junction between the tank shell plate, skid casting, and BOV flange must be completely

[3] The 300 designation is a stub sill design style classification the AAR Tank Car Committee assigned to certain ARI and ACF manufactured tank cars.

fused (melted) together, creating a solid barrier capable of holding the contents of the tank). The defects FRA detected ranged from 2-1/2-inches to over 17-1/2-inches long and up to 3/8-inch deep.

Subsequently, CIT sent the tank car to ARI's repair facility in North Kansas City, Missouri. There, ARI removed the segment of the weld containing the defects and additional tank shell material containing the sump casting, the BOV skid casting, and the groove attachment welds, and sent the section to ESI in Aurora, Illinois, for metallurgical analysis.

ESI's analysis identified large pockets of trapped oxides (slag) starting just below the interior weld surface and extending almost completely through the weld thickness. For the failed welds on tank car CTCX 736177, the only way slag pockets (or slag inclusions) could form is if a welder does not follow appropriate welding practices during welding by failing to thoroughly clean and visually inspect every weld pass before depositing the next weld pass as the Hazardous Materials Regulations (HMR; 49 CFR parts 171-180)[4] and AAR's Tank Car Manual[5] require. The slag pockets prevented the complete fusion of the joint between the tank plate and the castings and produced the porosity and lack of fusion observed. Over time, these defects initiated and propagated cracks in the welds resulting in the tank leaking.

The HMR require all weld joints on tank car tanks to be fusion-welded in compliance with the requirements of the Tank Car Manual. For attachment welds to the tank, the Tank Car Manual requires the welder producing the welds to visually inspect the first pass and each layer of multi-pass welds to ensure each pass is free from cracks,

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[4] See 49 CFR § 179.200-10.

[5] AAR Manual of Standards and Recommended Practices, Section C-III, Specifications for Tank Cars (November 2014) (Tank Car Manual), at Appendix W.

overlap, incomplete fusion, and slag inclusions before depositing the next pass. To perform the required visual inspections properly the welder must thoroughly clean and inspect each pass before depositing the next pass. The presence of the slag pockets ESI identified in the groove attachment welds on tank car CTCX 736177 demonstrates the welder who deposited them did not follow these requirements.

Based on this incident, using ultrasonic testing techniques, CIT voluntarily inspected 386 additional tank cars in its fleet constructed to the same ARI 300 and ACF 300 design and equipped with a two-piece cast sump and BOV skid (sister cars). Approximately 15 percent of the sister cars inspected had the same defects as those identified in CTCX 736177, ranging from ½-inch to 22-inches long and from 1/8-inch to 0.39-inches deep. The approved tank car arrangement design drawings require welds to be either 7/16-inch or ½-inch thick at these locations. In other words, the slag pockets in the sump and BOV skid groove attachment welds of some sister cars were almost as deep as the welds were thick, resulting in less than full fusion of the weld joint (and meaning the welds were almost hollow). Welds with such extensive amounts of slag and incomplete fusion are not likely to withstand the design stresses and in-train forces they will encounter. Over time, these conditions will initiate and propagate cracks, either partially or completely through the weld, as occurred with tank car CTCX 736177.

FRA's review of CIT's inspection and test records of the sister cars revealed similar defects to those found in the attachment groove welds of tank car CTCX 736177 in cars welded by six other welders, not just the welder of CTCX 736177. Therefore, FRA concludes other welders assigned to make the attachment groove welds did not properly clean and inspect the welds during the manufacturing process. FRA also believes the single bevel groove weld joint design for these welds that allowed the slag to

accumulate at the root of the welds and along the walls of the tank plate, sump, and BOV skid castings made cleaning and inspecting the welds more difficult, and contributed to the defects in the welds.

Based on information provided by ARI, FRA understands between 2009 and 2015, ARI and ACF together manufactured approximately 14,800 general purpose tank cars to the same 300 stub sill design with the same two-piece cast sump and BOV skid weld design.[6] Accordingly, FRA believes the defects causing the leak in CTCX 736177 are likely to be in many of the 14,800 tank cars produced.

II. DIRECTIVE

Upon the date of issuance of this Directive, tank car owners must:

1. Identify the railroad tank cars in their fleet manufactured by ARI or ACF to the ARI 300 or ACF 300 stub sill design and equipped with a two-piece cast sump and BOV skid and provide to FRA within 30 days of the issuance of this Directive, the reporting mark and number of each car. Before offering a tank car for transportation under the conditions of this Directive, the tank car owner or other offeror of the car, shall ensure there is no visible leak from the BOV saddle and sump weld areas, the car complies with all applicable regulatory requirements, and is in a safe condition for transportation. Each time a car subject to this Directive is offered into transportation, this visual inspection of the BOV saddle and sump weld area must be performed to ensure there is no visible leak from the BOV saddle or sump weld areas. The person performing the inspection must document the inspection and provide a copy of the inspection results

[6] ARI changed the sump and BOV skid groove attachment weld design in 2015 as a result of the incident with CTCX 736177.

to the tank car owner within 30 days of the inspection. Tank car owners must maintain the records of these inspections for 10 years.

2. Inspect and test the sump and BOV skid groove attachment welds as follows:

a. Facilities. All inspections and tests required by this Directive (other than the visual inspection required by paragraph 1 above) must be performed by tank car facilities (defined at 49 CFR 179.2) certified by the AAR consistent with Appendix B of the Tank Car Manual. (Appendix B provides the requirements for tank car facilities to obtain AAR certification.)

b. Procedures. Due to the subsurface location of the identified slag inclusions and related cracks, volumetric inspection methods (ultrasonic testing), must be used in conjunction with surface inspection methods (liquid penetrant, magnetic particle and visual inspection) to ensure the welds are completely examined.

i. All NDT, including visual inspection, must be performed consistent with written procedures described in Appendix T, paragraph 1.18 of the Tank Car Manual and approved by an individual qualified and certified as a Level III in the NDT method. (Appendix T provides the requirements for qualification and certification of NDT procedures and personnel for tank cars.)

ii. All NDT procedures and techniques used, including procedures for visual inspection, must be capable of locating, interpreting, evaluating, and sizing cracks, incomplete penetration, incomplete fusion, and slag inclusions to a level of sensitivity and reliability of 90% (90% probability of detection).[7] Ultrasonic testing methods and

[7] Probability of detection is a quantitative measure of the likelihood of finding defects of a specific type and size resulting from statistics-based detection experiments using actual or engineered flaw sets, see *Department of Defense Handbook Nondestructive Evaluation System Reliability Assessment MIL-HDBK-1823A* (2009).

techniques used must allow for clearance around internal attachments adequate to perform longitudinal and transverse wave scanning, including procedures for phased array ultrasonic testing, if used.

c. Personnel. All personnel, including subcontractors, reviewing and approving NDT procedures and reports, including visual inspections, must be qualified and certified to Level II or Level III consistent with Appendix T of the Tank Car Manual and the tank car facility's written practice.

i. In addition to the requirements of Paragraph c. above, all personnel performing NDT on these welds, and reviewing procedures and reports, including subcontractor personnel, must be trained and tested on the procedures to be used and samples representing the welds to be inspected consistent with 49 CFR part 172, subpart H, and Appendix T of the Tank Car Manual.

d. Acceptance Criteria. Interpretations and evaluations of inspections and tests shall comply with Appendix W of the Tank Car Manual.

e. Records. All inspection and test results must be documented, including re-inspections of repairs. The documentation must include the information described in Appendix T, paragraph 1.20 of the Tank Car Manual including the additional reporting requirements of Appendix T for the applicable NDT methods(s) chosen.

i. A separate record must be completed for each inspection and test performed on each tank car.

ii. The results of ultrasonic testing inspections must be recorded digitally and maintained with the inspection and test record.

iii. In addition to the record retention periods required by Chapter 1 of the Tank Car Manual for tank car facilities, the tank car owner must retain all records and

documentation required by this Directive for 10 years following the completion of the inspections and tests.

f. Schedule. The inspections and tests required by this Directive must be performed according to the following schedule:

i. Within 12 months from the date of issuance of this Directive for tank cars in hazardous materials service;

ii. Within 18 months from the date of issuance of this Directive for tank cars in non-hazardous materials service;

iii. Within 24 months from the date of issuance of this Directive for tank cars returning to service or withdrawn from storage and placed in hazardous or non-hazardous materials service prior to loading;

iv. Tank cars not inspected and tested according to this Directive may not be loaded and/or offered into transportation until they are inspected and tested in accordance with this Directive;

v. Tank car owners must include the results of the inspections and tests required by this Directive in the analysis of its qualification and maintenance program at the intervals required by 49 CFR 180.501 and 180.509;

vi. Within 60 days of the issuance of this Directive, each owner of a tank car subject to this Directive must notify all parties under contract to the car owner, including its lessees and/or sub-lessees, using the cars covered by the Directive of the terms of this Directive and the inspection and testing schedule.

g. Reports. Owners of tank cars subject to this Directive must report the inspection, test, and repair information to FRA as follows:

i. Tank car reporting mark(s) and number(s) of tank cars in an owner's fleet identified under paragraph (1) of this Directive;

ii. Planned inspection and test schedule for each tank car identified under paragraph (1) of this Directive, by reporting mark and number;

iii. Tank car facility (station stencil) that performed the inspection(s) and test(s);

iv. Date(s) the inspection(s) and test(s) were performed;

v. Inspection and test method(s) and procedure number(s) used;

vi. Name(s) of inspector(s) performing the inspection(s) and test(s), level(s) of certification(s), and method(s) certified;

vii. Inspection and test results;

viii. Corrective (repair) action(s) taken; and

ix. The type and date of any accidents, incidents, or releases from the tank car related to the welds that are the subject of this Directive.

The information may be submitted in written hardcopy format or sent electronically to: Larry Strouse, General Engineer, Hazardous Materials Division, Office of Technical Oversight, FRA, 200 W. Adams Street, Suite 310, Chicago, Illinois, 60606, (312) 353-6203, email: Larry.Strouse@dot.gov. FRA must receive initial reports by October 30, 2016 and subsequent status updates every 90 days thereafter.

h. Repairs. Prior to initiating any repairs, a tank car facility must obtain the tank car owner's written permission and approval of the qualification and maintenance program the tank car facility will use consistent with Appendices D, R, and W of the Tank Car Manual and 49 CFR § 180.513. A tank car facility must report all work

performed and all observed damage, deterioration, failed components, or noncompliant parts to the owner under 49 CFR § 180.513.

FRA will continue to monitor the performance of the tank cars subject to this Directive in hazardous materials service and will take all necessary regulatory or enforcement action to ensure the highest level of safety on the Nation's railroads is maintained. Regardless of any entity's compliance with this Directive, FRA reserves the right to seek civil penalties or to take any other appropriate enforcement action for violations of the HMR that have occurred.

III. Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) requires FRA to consider the impact of paperwork and other information collection burdens imposed on the public. FRA has determined that this Railworthiness Directive imposes new information collection requirements. FRA will be publishing a Paperwork Reduction Act notice for comment, following publication of this Directive.

IV. Agency Contact For Questions

If you have any questions concerning this Directive, contact Larry Strouse, General Engineer, Hazardous Materials Division, Office of Technical Oversight, FRA, 200 W. Adams Street, Suite 310, Chicago, Illinois 60606, (312) 353-6203, Larry.Strouse@dot.gov.

Dated:

for Robert C. Lauby,
Associate Administrator for Railroad Safety
Chief Safety Officer

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL RAILROAD ADMINISTRATION

RAILWORTHINESS DIRECTIVE (RWD)

RWD No. 2016-01 [REVISED]

This Revised Directive revises and supersedes FRA's Railworthiness Directive No. 2016-01 (Directive), issued on September 30, 2016. FRA is issuing this Revised Directive under 49 CFR 180.509(b)(4). This Revised Directive addresses concerns and requests for clarification FRA received from affected parties since it issued the original Directive. The revisions this Revised Directive makes are discussed in Section II below and the actual revisions to the Directive are in Section III below.

I. Background

FRA issued the Directive based on its finding that as a result of non-conforming welding practices, DOT-111 tank cars built by American Railcar Industries, Inc. (ARI) and ACF Industries, LLC (ACF) between 2009 and 2015 to the ARI and ACF 300 stub sill design and equipped with a two-piece cast sump and bottom outlet valve (BOV) skid may be in an unsafe operating condition and could result in the release of hazardous materials. As a result of non-conforming welding practices, FRA concluded these cars may have substantial weld defects at the sump and BOV skid groove attachment welds, potentially affecting each tank's ability to retain its contents during transportation. Further, FRA found using the tank cars with the defective welds identified violates the requirements of the Federal Hazardous Materials regulations (HMR; 49 CFR parts 171–180).[1] A more detailed background discussion is in the Directive.

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[1] See 49 CFR 179.200-10.

Generally, this Revised Directive requires tank car owners to: (1) identify tank cars in their fleet covered by the Revised Directive (covered cars); and (2) implement specific inspection and testing procedures to ensure no flaws exist in each tank car's sump and BOV skid groove attachment welds which could result in the loss of tank integrity. Specifically, this Revised Directive requires offerors of covered cars, before offering those cars into transportation, to visually inspect the BOV saddle and sump area to ensure there is no visible leak from those areas. This Revised Directive also requires each tank car owner to identify covered cars in hazardous materials service as of the issuance date of this Revised Directive and of those cars, ensure a 15% sample are inspected and tested by qualified personnel at tank car facilities within 12 months. The Revised Directive requires tank car facilities to use both volumetric inspection methods (ultrasonic testing) and surface inspection methods (e.g., liquid penetrant, magnetic particle or visual inspection) to ensure the welds at issue are completely examined. The Revised Directive also requires the nondestructive testing (NDT) methods used to be able to locate, interpret, evaluate, and size cracks, incomplete penetration, incomplete fusion, and slag inclusions to a level of sensitivity and reliability of 90% probability of detection (POD).

This Revised Directive also modifies certain recordkeeping requirements of the original Directive.

II. ARI and ACF Concerns With Directive and Requests for Modification

In letters, ARI and ACF expressed concerns with the Directive and asked FRA to reconsider certain requirements. Specifically, in its October 7, 2016, letter, ARI: (1) asked FRA to extend the effective date of the Directive 30 days; (2) indicated some

requirements of the Directive "appear to be impractical and confusing"; and (3) questioned the legality of some Directive requirements. In its October 13, 2016, letter, ACF asked FRA to reconsider including ACF-manufactured cars in the Directive, noting ARI had manufactured the failed tank car (CTCX 736177) and asserting no evidence exists that ACF-manufactured tank cars have the same weld conditions as CTCX 736177.

In ARI's October 14 and 27, 2016, letters, ARI asserted that the Directive imposed "unattainable standards for inspection and testing" due to the timeline for completing the required inspections and the requirement for inspection and testing to be conducted to a 90% POD. ARI asked FRA to amend the Directive to allow use of "currently accepted industry inspection" methodologies and asserted that even if FRA did allow the use of currently accepted inspection methodologies, due to capacity constraints at the nation's approximately 70 tank car shops, industry would need 5 years (until the end of 2021) to complete the inspections the Directive requires. ARI further asserted that by applying the Directive to cars already voluntarily inspected by ARI, Association of American Railroads (AAR) Specification 211 (AAR 211) cars, and cars currently in storage, FRA is applying the Directive to an overly broad class of cars. Accordingly, ARI recommended removal of the Directive's recordkeeping requirement related to the required pre-transportation visual inspection of the BOV saddle and weld area. ARI also expressed concern regarding the Directive's requirement to keep the results of ultrasonic testing inspections digitally and to train personnel reviewing, approving, and performing the inspections and tests required under the Directive. Finally, ARI asserted FRA lacks an objective justification for the Directive. In support of its assertions, ARI provided

FRA a summary report of its inspection results from 321 field inspections of cars built to the ARI 300 stub sill design and a summary of ARI's stress and fatigue analysis completed on the bottom fitting weld attachments of the cars.[2]

1. Effective Date.

FRA is extending the first deadline in this Revised Directive by more than 30 days from that of the original Directive to the date this Revised Directive is issued to provide stakeholders additional time to address technical and administrative issues regarding elements of the Directive that required clarification, as well as to provide necessary time to develop and distribute weld inspection procedures that meet the minimum criteria of the Directive.

2. Scope of Cars Subject to the Directive.

ARI and ACF expressed four concerns regarding the scope of cars subject to the Directive. First, noting that ACF manufactured 10% of the tank cars subject to the Directive, ARI and ACF asserted there is no evidence the ACF-manufactured tank cars have the same sump and BOV skid grove attachment weld conditions found in CTCX 736177 or other ARI-manufactured cars. Second, ARI noted that together with CIT Group Inc. (CIT Group Inc. owns a fleet of ARI-manufactured tank cars built to the ARI 300 stub sill design and equipped with a two-piece cast sump and BOV skid), ARI has already voluntarily inspected approximately 750[3] ARI-manufactured cars "without finding any leaks or cracks." Third, ARI and ACF expressed concern with the

[2] ARI, Summary Report on ARI Tank Cars built with Sump and Bottom Outlets, 2009-2015, ARI Report 1601 (Oct. 7, 2016).

[3] Based on the latest information ARI has provided, FRA understands that to date, ARI and CIT have inspected approximately 900 ARI-manufactured tank cars built to the ARI-300 stub sill design.

Directive's requirement to inspect out-of-service cars within 24 months. Fourth, ARI recommended removal of AAR 211 tank cars from the scope of the Directive.

FRA understands ARI and ACF's concerns, and the concerns of other industry participants dependent on having an ample supply of tank cars to meet their transportation needs.[4] FRA believes the failure of tank car CTCX 736177, and the defective weld conditions identified in a large number of ARI- manufactured cars of the same design, demonstrate the need to ensure all cars built to this particular design are inspected and repaired, as necessary, as soon as practicable. Nevertheless, FRA believes ARI and ACF's concerns about the scope of cars covered by the Directive and the Directive's recordkeeping requirements related to the required pre-trip visual inspection are valid. Accordingly, in this Revised Directive, FRA is revising aspects of the Directive to address these concerns and practical issues.

In response to ARI and ACF's concerns regarding ACF-manufactured tank cars, in this Revised Directive, FRA is implementing a sample inspection program for ACF tank cars to gather additional data to determine if this group of cars should be removed from the scope of the Revised Directive. FRA is also implementing a representative sampling program of the approximately 900 cars CIT and ARI have already voluntarily inspected. These sampling programs may provide data sufficient to exempt these groups of cars from the Revised Directive. However, the minimum inspection criteria of the Directive are different from the criteria ARI and CIT used to voluntarily examine tank cars prior to issuance of the Directive. Thus, after ARI and CIT complete the representative sample of inspections of those cars under this Revised Directive, FRA will

[4] See letter to Robert C. Lauby, FRA, from Jason F. Huette, Southwest Rail Industries (Oct. 31, 2016) (asserting Directive is "burdensome" on ARI and industry as a whole).

compare those inspection results with the inspection results of CIT and ARI's voluntary inspections. FRA will then determine whether the remaining previously examined tank cars should be exempted from the Revised Directive.

FRA agrees with ARI and ACF's concerns about the requirement to inspect out-of-service cars within 24 months, so FRA is removing the requirement to inspect tank cars not currently in hazardous materials service and the scope of the inspection and test requirement. This requirement now applies to 15% of tank cars currently in hazardous materials service with the highest mileage in each tank car owner's fleet. FRA believes prioritizing inspection of these higher mileage cars, which are more likely to have developed cracks or leaks, will provide the best information regarding the performance and reliability of the affected welds. FRA will monitor and analyze the results of the 15% sample over the next 12 months prior to implementing any additional test and inspection requirements for the remaining fleet of tank cars covered by this Revised Directive.

FRA does not agree, however, with ARI's request to exclude AAR 211 cars from the Directive. FRA believes no evidence exists justifying the exclusion of these cars.

3. Pre-Trip Visual Inspection Record.

ARI requested that FRA revise the requirement for offerors of tank cars to document and submit all pre-trip visual inspection records to the tank car owner. In response to this request, FRA is revising the recordkeeping requirement for the pre-trip inspection to require offerors to maintain the documentation of each visual inspection on-site, but only notify the tank car owner when a defective condition, such as a leak from the BOV/sump/skid area of the car, is detected. FRA agrees the important data from

these pre-trip inspections is whether a defective condition was identified, such as a leak from the BOV/sump or skid area of these cars. Providing notification to the tank car owner for every successful pre-trip visual inspection is an unnecessary burden, and, therefore, FRA is modifying this provision. FRA is, however, requiring offerors to notify FRA and the tank car owner of any leaks identified during the pre-trip visual inspection so FRA, and tank car owners, can monitor ongoing performance and reliability of the cars affected by this Revised Directive.

4. Insufficient Shop Capacity to Perform Required Tests and Inspections Within Timeframe Required.

FRA is modifying the Directive in response to ARI's assertion there is insufficient shop capacity to conduct the inspections and testing the Directive mandates within the timeframes the Directive requires. FRA recognizes the strain the timelines in the Directive may place on existing tank car cleaning, inspection, and repair capacity, but FRA notes that to date, one known hazardous material release has occurred from a car of this design and that release occurred less than 2 years after the car was originally manufactured (8 years prior to its scheduled qualification). Nevertheless, FRA is removing the requirement to test and inspect all covered cars and replacing it with a requirement to test and inspect a 15% sample of covered cars in hazardous materials service with the highest total mileage in each tank car owner's fleet within 12 months of the issuance date of this Revised Directive. In other words, if a tank car owner's fleet consists of 100 covered cars in hazardous materials service, the owner must ensure at least 15 cars (15% of the 100 covered cars in hazardous materials service) are inspected and tested under this Directive and those cars must be the cars with the highest total mileage in the owner's fleet of covered cars. FRA will monitor and analyze the results of

the 15% sample over the next 12 months prior to implementing any additional test and inspection requirements for the remaining fleet of tank cars subject to this Revised Directive.

5. 90% POD Requirement.

In its October 14, 2016, letter, ARI asserted there is a lack of tank car facilities qualified to conduct inspections and tests to the required 90% POD and it could take facilities up to 6 months to become properly qualified. Further, ARI noted the "POD is dependent on the size of the condition or flaw to be found" and "[w]ithout the target condition size information, it is not clear how tank car facilities will be able to create a methodology to satisfy the 90% POD requirement." ARI also requested clarification whether the 90% POD requirement applies to the entire inspection (surface and volumetric combined) or to each area (volumetric and surface) independently or to each inspection technique used.

FRA is clarifying the required inspection and test methods in response to ARI's concerns, but FRA believes utilizing a 90% POD is both feasible and necessary given the defects involved. It is important to note the Directive requires the procedure to be verified to 90% POD, as opposed to verifying each individual technician to 90% POD, and that the technicians must receive training on the specific procedure like any other required NDT procedure. FRA believes certifying a procedure to 90% POD is achievable for properly qualified inspectors and expert interpretation given the length of time the industry has had to refine their NDT procedures.[5]

FRA understands ARI has already achieved volumetric NDT procedures with 90% POD for the type and size of defects identified in this Revised Directive.

[5] 58 FR 48487 (1993).

Therefore, FRA believes ARI's concerns regarding this threshold are without merit. FRA does believe, however, ARI raises a valid technical point and is revising the Directive's inspection procedures to include specific dimensions of weld defects consistent with industry procedures demonstrated to identify surface and volumetric defects at a 90% POD. We are also clarifying the 90% POD applies to surface defects and volumetric defects independently.

6. Digitally Storing Ultrasonic Testing Records.

In its October 14, 2016, letter, ARI asserts "there is no way to physically store" an electronic ultrasonic test. FRA disagrees. FRA believes most ultrasonic testing is done using electronic devices capable of digitally downloading the results of the tests and where devices do not have the capability built in, the same data can be captured and recorded using digital photos and recordings of indications found (e.g., variances from the baseline reading). However, FRA also recognizes requiring digital images of inspections, or portions of inspections, that do not reveal indications is unnecessary and burdensome.

Accordingly, FRA is revising the Directive's requirement to digitally record and maintain the results of ultrasonic testing inspections to clarify digital images (e.g., digital photographs) of indications may be used to meet this requirement. Digital recordings or images are not required to be included in the record of the inspection when the inspection does not produce indications. FRA recognizes digital images or recordings alone are not sufficient, but digital images/recordings with proper records of the equipment used for the testing, the equipment type and settings (e.g., calibration data), and the written procedure used would provide adequate context for digital images or recordings.

7. Potential Shortage of Qualified Inspectors.

ARI expressed concern about a potential shortage of qualified Level II and III certified inspectors available to perform the Directive's required testing and inspection noting that it is not clear how many certified inspectors have been "additionally trained beyond the requirements of Appendix T as mandated by the Directive." Although FRA appreciates the challenge of ensuring a sufficient number of qualified and certified inspectors to carry out the number and types of inspections the Directive requires, FRA notes the Directive does not require training above and beyond Appendix T. NDT technicians are required to be trained on the specific NDT procedure provided by the tank car owner as currently required by Federal regulations for other tank car qualification work. A Level II or Level III qualified NDT technician should already have the technical proficiency in the particular NDT technique and FRA expects only minimal function specific training in the written procedure to be applied to this area of the tank car will be necessary.

8. FRA's Legal Authority to Issue the Directive.

In response to ARI's assertions that some requirements of the Directive may be unlawful and that FRA lacks an objective justification for the Directive, FRA notes that 49 CFR 180.509(b)(4) authorizes it to require the inspection and testing of tank cars outside of the cars' normal qualification intervals "based on the existence of an objectively reasonable and articulable belief that a tank car or a class or design of tank cars **may be in an unsafe operating condition.**" (Emphasis added.) The applicable regulations further define "objectively reasonable and articulable belief" as "a belief based on particularized and identifiable facts that provide an objective basis **to believe or**

suspect that a tank car or a class or design of tank cars may be in an unsafe operating condition." 49 CFR 180.503 (emphasis added). As outlined in the Directive, FRA inspection and testing of the failed tank car (CTCX 736177) built to the ARI 300 stub sill design identified large slag pockets just below the interior weld surface and extending almost completely through the weld thickness. Inspection of almost 400 additional cars built to this same design found 15% of the cars had the same defects as those identified in CTCX 736177, ranging from ½ inch to 22 inches long and from 1/8 inch to 0.39 inches deep. These defects make the cars noncompliant with Federal regulations and, because of this noncompliance, along with facts of the May 9, 2014, failure of tank car CTCX 736177, FRA reasonably believes or suspects and articulated why the cars may be in an unsafe operating condition.

III. DIRECTIVE

Upon the date of issuance of this Revised Directive, the requirements of RWD No. 2016-01 are revised to require tank car owners to:

1. Identify the railroad tank cars in their fleet manufactured by ARI or ACF to the ARI 300 or ACF 300 stub sill design and equipped with a two-piece cast sump and BOV skid (covered cars) and provide to FRA within 30 days of the issuance of this Revised Directive, the reporting mark and number of (1) all covered cars; (2) all covered cars in the owner's fleet in hazardous materials service as of the issuance date of this Revised Directive; and (3) of the identified covered cars in hazardous materials service, identify the top 15% of cars with the highest mileage. If 15% of the covered cars in hazardous materials service results in a decimal, then the decimal value must be rounded up (e.g., 15% of 10 tank cars results in a value of 1.5 and thus must be rounded up to 2 tank cars).

a. Before offering a tank car for transportation under the conditions of this Revised Directive, the tank car owner or other offeror of the car, must ensure there is no visible leak from the BOV saddle and sump weld areas, the car complies with all applicable regulatory requirements, and is in a safe condition for transportation.

b. The person performing the inspection must document the inspection and must make the results of the visual inspection available to FRA upon request. If a leak is identified, the results of the inspection must be documented and forwarded to the tank car owner and to FRA via email. Email notifications to FRA must be sent to HMASSIST@DOT.GOV.

2. Inspect and test the sump and BOV skid groove attachment welds as follows:

a. Facilities. All inspections and tests required by this Revised Directive (other than the visual inspection required by paragraph 1 above) must be performed by tank car facilities (defined at 49 CFR 179.2) certified by the AAR consistent with Appendix B of the AAR Tank Car Manual (Tank Car Manual).[6] (Appendix B provides the requirements for tank car facilities to obtain AAR certification.)

b. Procedures. Due to the subsurface location of the identified slag inclusions and related cracks, volumetric inspection methods (ultrasonic testing), must be used in conjunction with surface inspection methods (e.g., liquid penetrant, magnetic particle or visual inspection) to ensure the welds are completely examined.

i. All NDT, including visual inspection, must be performed consistent with written procedures described in Appendix T, paragraph 1.18 of the Tank Car Manual and approved by an individual qualified and certified as a Level III in the NDT method.

[6] AAR, Manual of Standards and Recommended Practices, Section C-III, Specifications for Tank Cars (Specification M-1002); Nov. 2014.

(Appendix T provides the requirements for qualification and certification of NDT procedures and personnel for tank cars.)

ii. All surface (liquid penetrant, magnetic particle and visual inspection) methods must be able to detect indications 0.188 (3/16) inches long by 0.016 (1/64) inches wide (maximum values) to a 90% POD. Volumetric NDT methods (e.g., ultrasonic testing (UT)) must be able to detect indications of major dimension 0.188 (3/16) inches by 0.125 (1/8) inches deep (maximum values) to a 90% POD. UT methods and techniques used must allow for clearance around internal attachments adequate to perform longitudinal and transverse wave scanning, including procedures for phased array UT, if used.

c. Personnel. All personnel, including subcontractors, reviewing and approving NDT procedures and reports, including visual inspections, must be qualified and certified to Level II or Level III consistent with Appendix T of the Tank Car Manual and the tank car facility's written practice.

i. In addition to the requirements of Paragraph 2.c., all personnel performing NDT on these welds, and reviewing procedures and reports, including subcontractor personnel, must be trained and tested on the procedures to be used and samples representing the welds to be inspected consistent with 49 CFR part 172, subpart H, and Appendix T of the Tank Car Manual.

d. Acceptance Criteria. Interpretations and evaluations of inspections and tests must comply with Appendix W of the Tank Car Manual.

e. Records. All inspection and test results must be documented, including re-inspections of repairs. The documentation must include the information described in

Appendix T, paragraph 1.20 of the Tank Car Manual including the additional reporting requirements of Appendix T for the applicable NDT methods(s) chosen.

i. A separate record must be completed for each inspection and test performed on each tank car.

ii. The results of UT inspections must be recorded and digital recordings or images of indications (i.e., any variance from the baseline reading) found must be maintained with the inspection and test record.

iii. In addition to the record retention periods required by Chapter 1 of the Tank Car Manual for tank car facilities, the tank car owner must retain all records and documentation required by this Revised Directive for 10 years following the completion of the inspections and tests.

f. Schedule. The inspections and tests required by this Revised Directive must be performed according to the following schedule:

i. Within 12 months of the issuance date of this Revised Directive, 15% of each owner's fleet of covered cars in hazardous materials service with the highest total mileage must be tested and inspected;

ii. Tank car owners must include the results of the inspections and tests required by this Revised Directive in the analysis of their qualification and maintenance program at the intervals required by 49 CFR 180.501 and 180.509;

iii. Within 60 days of the issuance of this Revised Directive, each owner of a tank car subject to this Revised Directive must notify all parties under contract to the car owner, including its lessees and/or sub-lessees, using the cars covered by the Revised

Directive of the terms of this Revised Directive and the inspection and testing schedule; and

iv. After receiving the notification required by paragraph 2.f.iii, a lessee or other offeror of a tank car subject to this Revised Directive, must document each pre-trip inspection required under paragraph 1 of this Revised Directive.

g. Reports. Owners of tank cars subject to this Revised Directive must report the inspection, test, and repair information to FRA as follows:

i. Tank car reporting mark(s) and number(s) of tank cars in an owner's fleet identified under paragraph 1 of this Revised Directive;

ii. Planned inspection and test schedule for each tank car identified under paragraph 1 of this Revised Directive for inspection (i.e., 15% of the tank car fleet in hazardous materials service with the highest mileage), by reporting mark and number;

iii. Tank car facility (station stencil) that performed the inspection(s) and test(s);

iv. Date(s) the inspection(s) and test(s) were performed;

v. Inspection and test method(s) and procedure number(s) used;

vi. Name(s) of inspector(s) performing the inspection(s) and test(s), level(s) of certification(s), and method(s) certified;

vii. Inspection and test results;

viii. Corrective (repair) action(s) taken; and

ix. The type and date of any accidents, incidents, or releases from the tank car related to the welds that are the subject of this Revised Directive.

The information must be submitted in written hardcopy format or sent electronically to: Larry Strouse, General Engineer, Hazardous Materials Division, Office of Technical Oversight, FRA, 200 West Adams Street, Suite 310, Chicago, Illinois, 60606, (312) 353-6203, email: Larry.Strouse@dot.gov. FRA must receive initial reports within 30 days from the date of issuance of this Revised Directive and subsequent updates every 90 days until a tank owner has met the inspection and testing requirements of paragraph f.1.

h. Repairs. Prior to initiating any repairs, a tank car facility must obtain the tank car owner's written permission and approval of the qualification and maintenance program the tank car facility will use consistent with 49 CFR 180.513 and Appendices D, R, and W of the Tank Car Manual. A tank car facility must report all work performed and all observed damage, deterioration, failed components, or noncompliant parts to the owner under 49 CFR 180.513.

i. Exemption. Notwithstanding the scope of this Revised Directive, FRA may grant relief from this Revised Directive for ACF-manufactured tank cars and/or for tank cars that ARI and CIT voluntarily inspected prior to November 15, 2016, if: (A) a representative sample is inspected consistent with this Revised Directive; (B) the results of the inspections are provided to FRA for review; and (C) the results provide sufficient evidence to warrant FRA exemption of that group of tank cars from this Revised Directive. The required sample sizes to request exemption are as follows:

(A) ACF tank cars manufactured to the ACF 300 design: 125

(B) Cars voluntarily inspected prior to November 15, 2016: 80

FRA will continue to monitor the performance of the tank cars subject to this Revised Directive in hazardous materials service and will take all necessary regulatory or enforcement action to ensure the highest level of safety on the nation's railroads is maintained. Regardless of any entity's compliance with this Revised Directive, FRA reserves the right to seek civil penalties or to take any other appropriate enforcement action for violations of the HMR that have occurred.

IV. Agency Contact for Questions

If you have any questions concerning this Revised Directive, contact Larry Strouse, General Engineer, Hazardous Materials Division, Office of Technical Oversight, FRA, 200 West Adams Street, Suite 310, Chicago, Illinois 60606, (312) 353-6203, Larry.Strouse@dot.gov.

Dated: NOV 18 2016

Robert C. Lauby,
Associate Administrator for Railroad Safety
Chief Safety Officer